INTRODUCTION

EnSight Gold now supports general parallel rendering for increased performance and display resolution. This section describes the default behavior of EnSight as well as the command-line parameters necessary to customize the parallel rendering capabilities. With hardware rendering these features are only supported on SGI hardware at this time. Using software rendering (ensight7 -X) these features are supported on all platforms for which CEI support pthreads.

BASIC OPERATION

Configuration for Main Window

When run on a multi-pipe X server (monster pipe), EnSight will auto-configure to use all available pipes to accelerate rendering in the main EnSight GUI window. There is a command-line option (-prsw <config>) to specify an alternate parallel configuration. If you are on a multi-pipe server and would like to run with only one pipe, "-prsw none" will turn off parallel rendering for the main window. It is also possible to run EnSight on multiple graphics pipes which run under separate X servers. In this case it will be necessary to create a configuration file with the following format:

PRSw 1.0
<n> <p0> <p1> ... <p(n-1)>

where:
  <n> = number of worker pipes (excluding main EnSight display)
  <pi> = an X display (i.e. b21:0.2)

Example:

PRSw 1.0
7 :0.1 :0.2 :0.3 :4.0 :4.1 :4.2 :4.3

In the example above, there are two X servers (:0 and :4) which each manage four graphics pipes. Note that the configuration file should not include the pipe on which you are running. The configuration file specifies ADDITIONAL pipes that you would like to use. Also note that EnSight does not take care of resource allocation. You must have display access to any pipe that you hope to use for the parallel rendering (usually means logging in at a console).

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Parallel software rendering is available on some platforms when EnSight is run with the "-X" option. The same configuration file format may be used in this case, although the displays themselves are not actually opened. For convenience, if the configuration file is not found and "<config>" is a number, this number will be interpreted as the number of parallel rendering workers. For example:

        ensight7 -X -batch -prsw 3 -p <cmdfile>

will run a batch session with 4 worker threads performing parallel rendering.

Configuration for Detached Windows

The parallel renderer also supports rendering to detached displays (external to the EnSight GUI). Use the option "-prsd2 <config>" to specify the layout of the display. The display config file format is:

PRSd 1.0
<w> <h>   : width/height of the complete display
<numpipes>   : number of logical displays
<xdisplay> <w> <h> <xo> <yo> <lxo> <lyo> [eye]
                           : parameters for each pipe. The xdisplay

: is of the format :2.0, etc. Width &
: height describe the subset of the total
: display rendered by this pipe. The x
: and y origin give the offset of this
: display in the global display. The
: "local" x and y origin give the offset
: of this window on the given display.
: This is often needed for passive stereo.
: [eye] is an optional parameter (L or R)
: to specify an eye for passive stereo

(repeat above line for numpipes)

Example 1

In this example there is one Xserver with four screens. For best operation the GUI should be displayed on a separate pipe. .
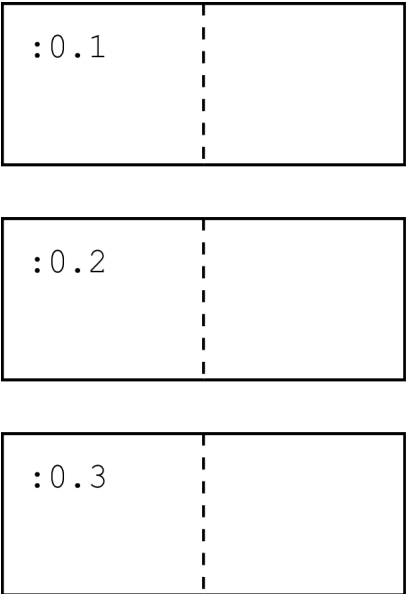
:1.2	:1.3
:1.0	:1.1

```
PRSd 1.0
2560 2048
4
:1.0 1280 1024    0    0    0    0
:1.1 1280 1024 1280    0    0    0
:1.2 1280 1024    0 1024    0    0
:1.3 1280 1024 1280 1024    0    0
```
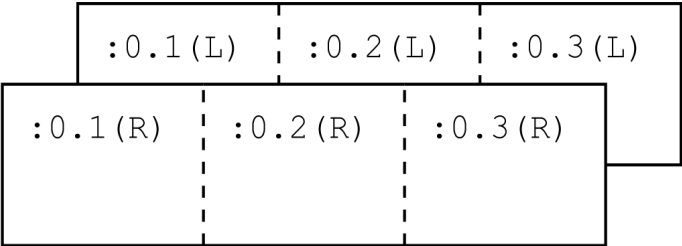
Example 2

In this example there is a single X server managing three pipes. Each pipe has two output channels which are sent to overlapping projectors with polarized filters for passive stereo.

Pipes:

:0.1	

:0.2	

Display:

:0.1(L)	:0.2(L)	:0.3(L)
:0.1(R)	:0.2(R)	:0.3(R)

:0.3	

```
PRSd 1.0
3024 1008
6
:0.1 1008 1008    0    0    0    0 L
```

```
:0.1 1008 1008   0   0 1008   0 R
:0.2 1008 1008 1008   0   0   0 L
:0.2 1008 1008 1008   0 1008   0 R
:0.3 1008 1008 2016   0   0   0 L
:0.3 1008 1008 2016   0 1008   0 R
```

Note that the 'L/R' parameters are NOT necessary when using traditional quad-buffered stereo to drive the polarized projectors. In this case a simple mono configuration file is sufficient, and the "test: prsstereo2" command (see below), or use of the F12 key, will toggle between mono and stereo display.

Example 3

Note that it is fairly easy to test large displays on smaller systems. The passive stereo display might be tested with:

```
PRSd 1.0
768 256
6
:0.0 256 256   0   0   0   0 L
:0.0 256 256   0   0   0 256 R
:0.0 256 256 256   0 256   0 L
:0.0 256 256 256   0 256 256 R
:0.0 256 256 512   0 512   0 L
:0.0 256 256 512   0 512 256 R
```

The above configuration file simulates the six-pipe passive stereo example on a single-pipe machine, with each display represented by a 256x256 window.

Example 4

It is possible to combine the monster and powerwall rendering capabilities if you have enough pipes. The way to do this is to generate a PRSw file (as in the above section) with one line per display. For example, to use 8 pipes for the 4-panel powerwall configuration of Example 1, you might have a worker file such as:

:1.2 :2.2	:1.3 :2.3
:1.0 :2.0	:1.1 :2.1

```
PRSw 1.0
1 :2.0
1 :2.1
1 :2.2
1 :2.3
```

The lines of this file correspond one-to-one to the lines in the display file. The name of the detached display worker file is specified with the "-prsw2" command-line parameter.

OTHER NOTES

1. Currently auto-configuration of monster mode occurs for all displays accessed by the parallel renderer. This may cause problems when you do not specify a worker file and your powerwall pipes are all managed by one X server. You need to use "-prsw2 none" in order to specify that no workers should be created for the powerwall.

2. Stereo mode and full-screen mode work as usual in the main GUI window. In stereo mode the pipes get split into left-eye/right-eye groups (only in the case of single-pipe mode does one pipe render both eyes). When configured to use a detached display, the main GUI window will always be monoscopic. Pressing the F12 key for stereo will only affect the detached diaplay.

3. Annotation and plot mode work as usual for monster-mode. Detached displays are only updated when in part mode. The effects of plot mode and annotation mode are not visible until part mode is selected.

Options

Several parallel rendering options can be set either through the command dialog or through command-line options to the ensight7 or ensight7.client commands.

test: prssort [first|last]

Select a sorting method. Currently both sort-first and sort-last are supported. Sort-first tiles the screen into rectangular regions, one for each pipe. Sort-last partitions the geometry to the multiple pipes, and composites the result. The command line arguments, `-sort_first` or `-sort_last` can also be used to invoke the desired sorting method

test: prstile

Toggle the display of tiles (if using sort-first). This is useful to monitor the load-balancing between the pipes.

test: prsbalance

Toggle load balancing for sort-first. Without load-balancing performance may vary greatly depending on the viewing parameters.

test: prsbbox

When using the detached displays it may be desirable to render only boxes in the main window. This command will toggle the feature. The command-line option "-bbox" will turn this feature on initially.

test: prsstereo2

Toggle stereo on the detached display (when started with -prsd2). Note that this is only necessary for quad-buffered stereo. If you are using a passive stereo config file the display is always in stereo. Note: the command-line option "-prsd2stereo" will turn this feature on initially, or pressing the F12 key (while the mouse is in the main graphics window) will turn on stereo for the detached display.

SEE ALSO

User Manual: **Parallel Rendering Setup**